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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/773,106	01/31/2001	Tomokazu Kakumoto	15162/03080	5452

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SIDLEY AUSTIN BROWN & WOOD LLP
717 NORTH HARWOOD
SUITE 3400
DALLAS, TX 75201

EXAMINER	
YE, LIN	

ART UNIT	PAPER NUMBER
2615	

DATE MAILED: 01/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/773,106	KAKUMOTO ET AL.	
	Examiner	Art Unit	
	Lin Ye	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 2* is/are rejected.

7)☒ Claim(s) *10-16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 January 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/31/01*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of the election of species corresponding to Figure 8 in the reply filed on July 19, 2004 is acknowledged.

2. Claims 3-9 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species corresponding to Figure 7, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on July 19, 2004.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuroda et al. U.S. 6,469,740 in view of Collins et al. U.S. 6,507,519.

Referring to claim 1, the Kuroda reference discloses in Figures 1-2, an image-sensing device (See Col. 7, lines 1-5) comprising: a plurality of pixels (picture elements 23) that generate an electric signal proportional to an amount of incident light and then output the electric signal (See Col. 7, lines 8-13); and a level adjuster (the operational amplifier 43 and

reset transistor 36 together are considered as a level adjuster; e.g., during the reset operation period, the output electric signal of pixel at output node 31 can be adjusted with high accuracy because feedback by the operational amplifier 43, see Col. 8, lines 41-64) that adjusts a level of the electric signal output from the pixels by adjusting according to the electric signal output from the pixels a bias voltage fed (the reset voltage ΦR is a bias voltage fed to the gate electrode of the load transistor 37, see Col. 8, lines 31-34) the pixels (23). However, the Kuroda reference does not explicitly state the electric signal generated by the plurality of pixels (23) as an analog signal that is natural-logarithmically proportional to the amount of incident light.

The Collins reference teaches in Figures 2-3, an image-sensing device (See Col. 5, lines 41) comprising: a plurality of pixels (each pixels show in Figure 3) that generate an electric signal proportional to an amount of incident light and then output the electric signal (V_x) as an analog signal that is natural-logarithmically proportional to the amount of incident light (See Col. 5, lines 65-66). The Collins reference is evidenced that one of ordinary skill in the art at the time of the invention to see more advantages when the imaging-sensing device is a logarithmic type imaging sensor so that has very wide dynamic range with makes the imaging-sensing device suitable for imaging external scenes (See Col. 6, lines 15-22). For that reason, it would have been obvious one having ordinary skill in the art at the time of the invention was made to modify the imaging-sensing device of Kuroda by providing a logarithmic type imaging sensor for generating the output imaging electric signal as an analog signal that is natural-logarithmically proportional to the amount of incident light as taught by Collins.

Referring to claim 2, the Kuroda reference discloses wherein the pixels are arranged in a matrix so as to form an area sensor as a whole as shown in Figure 1 (See Col. 7, lines 1-5).

Allowable Subject Matter

5. Claims 10-16 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

For claim 10, the prior art does not teach or fairly suggest an image-sensing device comprising a plurality of pixels and a level adjuster; wherein the pixels each comprise: a photosensitive element receiving at a second electrode thereof a direct-current voltage; a transistor having a first electrode, a second electrode, and a control electrode, the transistor having the second electrode thereof connected to a first electrode of the photosensitive element so that electric charge output from the photosensitive element flows into the transistor, the transistor receiving at the first and control electrodes thereof direct-current voltages individually so that the transistor operates in a subthreshold region, wherein the level adjuster adjusts the level of the electric signal output from the pixels by adjusting the direct-current voltage applied to the control electrode of the transistor.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Brehmer et al. U.S 6,130,423 discloses an image-sensing device has a feedback block 580 that used for setting a gain value as shown in Figure 5.

b. Dierickx et al. U.S. 5,933,190 discloses an image-sensing device has a photocurrent to voltage transition is logarithmically dependent on the current.

c. Kozlowski et al. U.S. 6,532,040 discloses an image-sensing device has an amplifier having a having which is the inverse of the ratio of the first to the second capacitance.

d. McCaffrey et al. U.S. 6,101,294 discloses an imager has an array of photo detectors and a image adjuster as shown in Figure 2.

e. Iwamoto U.S. 5,576,761 discloses an image-sensing device generating a reference voltage logarithmically proportional to an average intensity of the incident light.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lin Ye whose telephone number is (703) 305-3250. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew B Christensen can be reached on (703) 308-9644. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lin Ye
Examiner
Art Unit 2615

Lin Ye
December 22, 2004